

**[0080]** Ofn, Ocn, Ofp, Ocp, Hys, Off are expressed in dB.

**[0081]** Here, Ocn is the CRE of the neighbour cell and Ocp the CRE of the serving cell (PCell). The CRE of each cell in the list of candidates is configured in the field cellIndividualOffset of the associated measObject.

**[0082]** According to embodiments of the invention, event A3 is modified as follows (exemplarily shown for the method of FIG. 5; changes underlined):

Event A3 (Neighbour becomes offset better than PCell)	
The UE shall:	
1>	consider the entering condition for this event to be satisfied when condition A3-1, as specified below, is fulfilled;
1>	consider the leaving condition for this event to be satisfied when condition A3-2, as specified below, is fulfilled;
NOTE	The cell(s) that triggers the event is on the frequency indicated in the associated measObject which may be different from the (primary) frequency used by the PCell.
Inequality A3-1 (Entering condition)	$Mn + Ofn + Ocn - Hys > Mp + Ofp + Ocp + Off$
Inequality A3-2 (Leaving condition)	$Mn + Ofn + Ocn + Hys < Mp + Ofp + Ocp + Off$

**[0083]** The variables in the formula are defined as follows:

**[0084]** Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

**[0085]** Ofn is the frequency specific offset of the frequency of the neighbour cell (i.e. offsetFreq as defined within measObjectEUTRA corresponding to the frequency of the neighbour cell).

**[0086]** Ocn is the cell specific offset of the neighbour cell (i.e. cellIndividualOffset as defined within measObjectEUTRA corresponding to the frequency of the neighbour cell), set to zero if not configured for the neighbour cell, and set to  $\min(\text{cellIndividualOffset of the neighbour cell}, \text{cellIndividualOffset of the PCell} + TH)$  if  $\text{cellIndividualOffset of the neighbour cell} > 0$ ,  $\text{cellIndividualOffset of the PCell} > 0$  and  $\text{cellIndividualOffset of the PCell} < \text{cellIndividualOffset of the neighbour cell}$ .

**[0087]** Mp is the measurement result of the PCell, not taking into account any offsets.

**[0088]** Ofp is the frequency specific offset of the primary frequency (i.e. offsetFreq as defined within measObjectEUTRA corresponding to the primary frequency).

**[0089]** Ocp is the cell specific offset of the PCell (i.e. cellIndividualOffset as defined within measObjectEUTRA corresponding to the primary frequency), is set to zero if not configured for the PCell, and set to  $\min(\text{cellIndividualOffset of the PCell}, \text{cellIndividualOffset of the neighbour cell} + TH)$  if  $\text{cellIndividualOffset of the neighbour cell} > 0$ ,  $\text{cellIndividualOffset of the PCell} > 0$  and  $\text{cellIndividualOffset of the PCell} < \text{cellIndividualOffset of the neighbour cell}$ .

**[0090]** Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

**[0091]** Off is the offset parameter for this event (i.e. a3-Offset as defined within reportConfigEUTRA for this event).

**[0092]** Mn, Mp are expressed in dBm in case of RSRP, or in dB in case of RS RQ.

**[0093]** TH is the maximum difference between cell specific offsets of the PCell and the neighbour cell

**[0094]** Ofn, Ocn, Ofp, Ocp, Hys, Off, TH are expressed in dB.

**[0095]** Alternatively, embodiments of the invention may be implemented as a new event in addition to event A3.

**[0096]** Embodiments of the invention are described with respect to macro eNB and pica eNB. However, embodiments of the invention may be applied to any kind of base stations where a cell range extension (CRE) is applied. In particular, embodiments of the invention may be applied to homogeneous networks, too.

**[0097]** Embodiments of the invention are described with respect to 3GPP Rel. 10. However, embodiments of the invention may be applied to any radio technology comprising cell selection based on a cell range extension, in particular any other 3GPP release.

**[0098]** Embodiments of the invention are described for two NodeBs which may potentially serve the user equipment. However, in embodiments of the invention, more than two NodeBs may potentially serve the user equipment. In this case, the selection process is performed between the serving cell (in case of handover) or a first candidate cell (in case of cell selection) and each of the candidate cells separately, e.g. in decreasing order of RSRP, according to the above described embodiments of the invention. Embodiments of the invention are described with RSRP as a criterion for cell selection and/or handover. However, other signal strength indicators than RSRP, e.g. RSRQ, may be used instead.

**[0099]** A UE may be a user equipment, a terminal, a mobile phone, a laptop, a smartphone, a tablet PC, or any other device that may attach to the mobile network. A base station may be a NodeB, an eNodeB or any other base station of a radio network.

**[0100]** If not otherwise stated or otherwise made clear from the context, the statement that two entities are different means that they are differently addressed in their respective network. It does not necessarily mean that they are based on different hardware. That is, each of the entities described in the present description may be based on a different hardware, or some or all of the entities may be based on the same hardware.

**[0101]** According to the above description, it should thus be apparent that exemplary embodiments of the present invention provide, for example a user equipment apparatus such as a UE, or a component thereof, an apparatus embodying the same, a method for controlling and/or operating the same, and computer program(s) controlling and/or operating the same as well as mediums carrying such computer program(s) and forming computer program product(s).

**[0102]** Implementations of any of the above described blocks, apparatuses, systems, techniques or methods include, as non limiting examples, implementations as hardware, software, firmware, special purpose circuits or logic, general purpose hardware or controller or other computing devices, or some combination thereof.

**[0103]** It is to be understood that what is described above is what is presently considered the preferred embodiments of the present invention. However, it should be noted that the description of the preferred embodiments is given by way of example only and that various modifications may be made without departing from the scope of the invention as defined by the appended claims.

1. Apparatus, comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code